(4) have the following positions relative to the geodetic triangulation station (T) marked by a drill hole in the concrete foundation of the pier on which the theodolite was mounted: The pier is 12.8 feet high; No. (1), or the northwest corner of the old Signal Service building, now used as a stable, is 177.4 feet southeast of the triangulation pier (T); No. (2), or the south chimney of the new Weather Bureau building, is 525.26 feet south, 75° 41′ east of (T); No. (3), the latitude pier, is 18.11 feet north, 88° 41′ west of (T); the nearest point of the bluff is distant about 72 feet north-northwest of (T). Differences in level are not given, but it is stated that the top of the peak is flat and nearly level, is a Government reservation covering many acres, and has easy access by means of the Manitou and Pikes Peak Cog Railway.

The so-called Great Hexagon has for its central point Wheeler Point, Nev., formerly known as Jeff. Davis Peak, in the Snake Range, White Pine County, Nev., latitude 38° 39′ N.; longitude 114° 19′ W. This station was established in 1878. A hexagon of slightly inferior dimensions adjoining it on the west, having Toiyabe Dome as its center. The meteorologist, knowing well the great snowfall and terrible storms of this region, can appreciate the remarks on page 572:

> While engaged upon the work on Wheeler Peak (November 5–23) the party was practically buried in a snow drift 10 and 12 feet deep, the temperature of the air sank to 20° below zero Fahrenheit, and in order that the observations upon distant stations might be continued, deep and broad trenches had to be cut through the snowdrifts in the line of sight. The party suffered much from the intensity of this cold wave. The high snowdrifts which covered the living tents to within a foot or two of the apex saved the party from freezing to death.
>
> At this station the brilliancy of the reflected moonlight suggested to the observer the selenotrope for occasional use at night, and it was experimented with at other stations.

The cold wave here referred to was apparently that which occurred in connection with the area of high pressure No. II, as described in the MONTHLY WEATHER REVIEW for November, 1882. The snowfall for that month was above the normal in the northwestern portion of California. The auroral displays were unusually frequent and brilliant and the accompanying electrical or ground currents on telegraph lines were unprecedented in Europe, as were also the magnetic storms of November 16–23. Auroras were recorded at Salt Lake City, Utah; Los Angeles, Cal.; Yuma, Ariz.; San Diego, Cal.; Galveston, Tex.; Punta Rassa, Fla., and thence northward into Canada, being the most remarkable exhibition on record since 1859.

On pages 733–777 Dr. Schott discusses the effect upon geodetic work of the periodical change in latitude discovered by the astronomer, Dr. S. C. Chandler, At the present time these variations are less than one second of arc and are so nearly periodic that we are not yet able to speak of an appreciable secular change in latitude. But there can be no assurance that the rise and fall of continents and ocean beds and the consequent shifting of ocean water may not in the past have caused appreciable secular changes in the position of the pole relative to the earth. Of course, such changes would necessarily bring such a strain upon the earth's crust that it would yield or bend and crack, or rather, the trends and faults would cause the axis and latitudes to change. The earth taken as a whole, when we consider the geological faults that exist everywhere, must be treated as a viscous body continually yielding to strains due to luni-solar tides, the gravitation of its mass, the weight of the ocean, the atmosphere, the great lakes, and the great glaciers. It is rigid as steel to the strains of short periods, but plastic under long-continued strains. The yielding process is so slow, the faults proceed step by step so gradually, that great changes in surface features require geological ages for their evolution, while during this whole long time the general figure of the earth may remain the same as at the present day, i. e., the Clarke spheroid. It is certainly very interesting to learn, from page 871, that a combination of all the American measures shows that Clarke's spheroid of 1866, whose polar radius is 6,356,584 meters and equatorial radius is 6,378,206 meters represents the shape of the western continent quite accurately, and will continue to be adopted by the Survey until the measure of a meridional arc enables us to adopt definitely something appreciably better.

PERIODICITY IN METEOROLOGY.

The Weather Bureau has lately received many communications relative to supposed periodic or other systematic changes in the weather, depending upon variations in the Gulf Stream, variations in the sun spots, earthquakes, changes in terrestrial magnetism, and other more or less elusive subjects.

These communications must be taken as simply an evidence of the great importance of the weather to the human race. All wish to know about the laws that govern the changes in climate in order the better to arrange their business affairs. One correspondent asks whether the Gulf Stream has not undergone such changes as to prevent the recurrence of the damaging frosts and freezes that have done so much injury in Florida during the past six or eight years. If we were able to assure our correspondents that we understand all the laws that govern frosts and storms, they might indeed lay aside the ordinary precautions against disaster and proceed calmly in the assurance that such troubles are not now imminent; but it will not do for any one to discard protection against injurious conditions. If any periodicities have been discovered they are such as to be of very little importance in comparison with the ordinary irregularities of the weather. Thus, Brückner finds a period of about thirty-five years in the annual average temperatures, but the extent of this regular period is about half a degree Fahrenheit, while the irregularities in the annual mean temperatures amount to five or ten degrees. Köppen, by examining the mean annual temperatures for the world, found that in equatorial regions there was an amplitude of about one degree Fahrenheit, corresponding with the variations of the sun spots; but in polar latitudes this disappears, and the irregular nonperiodic changes become much larger. Quite lately, Lockyer, in a joint paper with his son, showed that possibly there may be a connection between the condition of the solar atmosphere, as shown by the widening of the lines of the solar spectrum, and the rainfall, temperature, or other meteorological phenomenon.

Now, all these and many other investigations go to confirm us in our belief that all the phenomena of nature, whether solar or terrestrial, physical or biological, are so intimately connected that through any one of them we may get some idea of what is going on in the other department, but they do not in the least justify us in believing that the principal fluctuations in one can be ascertained by studying those of another. To those who have studied the atmosphere it is plain enough that it contains within itself the elements and forces that are able to bring about all the great irregularities that affect mankind. Even the great changes of climate that appear to have occurred during geological ages can probably be explained by the study of the atmosphere and the earth, without having recourse to the stars, sun spots, meteors, magnetism, electricity, or Fourier's hypothesis of warm and cold regions in the space through which the earth is supposed to travel.